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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s):	Rajendra R. Damle
Assignee:	Ceterus Networks, Inc.
Title:	Frame Structure and Method for Wavelength Concatenated Channel Framing
Serial No.:	Unassigned	Filing Date:	Herewith
Examiner:	Unassigned	Group Art Unit:	Unassigned
Docket No.:	CET0006C2US		
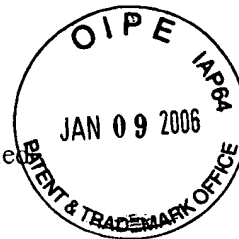
Austin, Texas
September 8, 2004

COMMISSIONER FOR PATENTS
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PRELIMINARY AMENDMENT AND REMARKS

Dear Sir:

The following Preliminary Amendment and Remarks are submitted for entry into the continuing application filed herewith (this application being a continuation from application serial number 10/086,273 (filed February 20, 2002). Further examination and consideration are requested.

Amendments to the Specification begin on page 2 of this paper.

Amendments to the Claims are reflected in the listing of claims which begins on page 5 of this paper.

No Amendments to the Drawings are presented in this paper.

Remarks begin on page 15 of this paper.

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Amendments to the Specification

Please replace the paragraph on page 1, lines 5-10 with the following amended paragraph:

This application is a continuation of U.S. Patent Application Serial No. 10/086,273, entitled "FRAME STRUCTURE AND METHOD FOR WAVELENGTH CONCATENATED CHANNEL FRAMING", filed February 20, 2002, and naming Rajendra R. Damle as the inventor, which, in turn, ~~This application~~ is a continuation-in-part of Patent Application Serial No. 10/074,264 [~~Attorney Docket Number M-9927 US~~_____], entitled " TRANSPORT OF HIGH-BANDWIDTH DATASTREAMS OVER A NETWORK," filed on Feb. 12, 2002, and having R. Damle, Y. Lee, W. Szeto, R. Butler and H. M. Zadikian as inventors, which, in turn, claims priority from the following provisional patent applications under 35 U.S.C. §119(e):

Please delete the first full paragraph under the header "SUMMARY OF THE INVENTION," starting at the bottom of page 4. Please insert the following paragraphs following the header "SUMMARY OF THE INVENTION", in the location of deleted paragraphs:

The present invention provides a method, system, apparatus, and computer program product that provide a means for responding to a degradation condition of one or more sub-channels of a super-channel network link linking a network node with a remote network node.

Accordingly, one aspect of the present invention provides a method for receiving a degradation notification that a sub-channel of a connection to a remote node is degraded. This aspect of the present invention further provides a method for responding to the degradation notification by transmitting an empty payload on the sub-channel.

A further aspect of the present invention provides a method for analyzing for degradation a signal received on a sub-channel of a connection to a remote node. Upon a determination that the signal is degraded, informing the remote node that the sub-channel is experiencing degradation and analyzing subsequent signals received on the sub-channel

for correction of the degradation. The connection to the remote node comprises a plurality of sub-channels.

Another aspect of the present invention provides a system comprising first and second network nodes. The first network node is configured to perform analysis of a signal transmitted to that node by a second network node on a sub-channel, in order to determine whether the signal is degraded. If the signal is degraded, the first network node informs the second network node of the degradation of the sub-channel. The second network node is configured to respond to the degradation information by transmitting an empty payload to the first network node on the first sub-channel.

A further aspect of the present invention provides an apparatus comprising a means for receiving a degradation notification that a sub-channel of a connection to a remote node is degraded, and a means for responding to the degradation notification by transmitting an empty payload on the sub-channel.

Another aspect of the present invention provides an apparatus comprising a means for analyzing for degradation a signal received on a sub-channel of a connection to a remote node and a means, responsive to a degradation determination, for informing the remote node that the sub-channel is experiencing degradation and for analyzing subsequent signals received on the sub-channel for correction of degradation. The connection comprises a plurality of sub-channels.

A further aspect of the present invention provides a computer program product comprising signal bearing media bearing programming adapted to receive a degradation notification that a sub-channel of a connection to a remote node is degraded, and to transmit an empty payload on the sub-channel in response to the notification.

Another aspect of the present invention provides a computer program product comprising signal bearing media bearing programming adapted to analyze for degradation a signal received on a sub-channel of a connection to a remote node, and, upon a determination that the signal is degraded, to inform the remote node that the sub-channel is experiencing degradation and to analyze subsequent signals received on the sub-channel for correction of the degradation.

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On page 58, please cancel the Abstract. Please replace the Abstract with the following:

A method, system, apparatus, and computer program product that provide a means for responding to a degradation condition of one or more sub-channels of a super-channel network link linking a network node with a remote network node is disclosed.

Serial No.: Unassigned

Amendments In the Claims

Please cancel claims 1-19. Please add claims 20-69 as follows:

1-19. (Cancelled)

20. (New) A method comprising:

receiving a degradation notification that a first sub-channel of a first connection to

a remote node is degraded; and

responding to the degradation notification by transmitting an empty payload on

the first sub-channel.

21. (New) The method of Claim 20, wherein the first connection with the remote
node comprises:

one or more sub-channels.

22. (New) The method of Claim 21 further comprising:

receiving a sub-channel bitmap comprising a status corresponding to each of the

one or more sub-channels, wherein

the status comprises one of

the degradation notification, and

notification that the sub-channel is not degraded.

23. (New) The method of Claim 20 further comprising:

transmitting a payload comprising data on a second sub-channel of a second

connection with the remote node, wherein

the payload comprising data would have been transmitted on the first sub-

channel but for the degradation.

24. (New) The method of Claim 20 further comprising:

receiving a non-degradation notification that the first sub-channel of the first

connection with the remote node is no longer degraded; and

responding to the non-degradation notification by transmitting a payload

comprising data on the first sub-channel.

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25. (New) A method comprising:

analyzing for degradation a signal received on a first sub-channel of a first

connection to a remote node, wherein

the first connection comprises a plurality of sub-channels; and

upon a determination that the signal is degraded,

informing the remote node that the first sub-channel is experiencing

degradation, and

analyzing subsequent signals received on the first sub-channel for

correction of the degradation.

26. (New) The method of Claim 25 wherein the analyzing for degradation

comprises:

analyzing the signal for at least one of the following error conditions

a bit error rate (BER) greater than a threshold value,

a loss of signal (LOS),

a loss of frame (LOF),

a cyclic redundancy check (CRC) error, and

a remote defect.

27. (New) The method of Claim 26 further comprising:

determining the presence of a remote defect upon receiving an alarm indication

signal transmitted by the remote node.

28. (New) The method of Claim 26 further comprising:

setting an error condition field corresponding to an error condition present,

wherein

the error condition field corresponds to the first sub-channel.

29. (New) The method of Claim 25 wherein informing the remote node

comprises:

generating a bitmap, wherein

each bitmap bit corresponds to a sub-channel in the first connection,

each bitmap bit is cleared at initialization, and

for each degraded signal received, setting the bitmap bit corresponding to

the sub-channel on which the degraded signal was received.

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30. (New) The method of Claim 29 wherein the informing the remote node further comprises:

transmitting the bitmap to the remote node.

31. (New) The method of Claim 29 wherein the analyzing subsequent signals received on the first sub-channel for correction of the degradation comprises:

receiving test signals on the first sub-channel comprising empty payloads;

analyzing the test signals for degradation;

upon a determination that the test signals are not degraded,

informing the remote node that the first sub-channel is not experiencing degradation.

32. (New) The method of Claim 31, wherein the informing the remote node that the first sub-channel is not experiencing degradation comprises:

clearing the bitmap bit corresponding to the first sub-channel; and

transmitting the bitmap to the remote node.

33. (New) The method of Claim 31 further comprising:

upon a determination that the test signals are not degraded,

clearing an error condition field corresponding to the first sub-channel.

34. (New) A system comprising:

a first network node configured to

perform analysis of a signal transmitted to the first network node on a first

sub-channel by a second network node, wherein

the analysis determines whether the signal is degraded;

upon a determination that the signal transmitted on the first sub-channel is

degraded, transmit to the second network node information

regarding the degradation of the first sub-channel; and

a second network node configured to

in response to the information regarding the degradation of the first sub-

channel, transmit an empty payload to the first network node on the

first sub-channel.

35. (New) The system of Claim 34 further comprising:

a first connection coupling the first network node and the second network node,
wherein

the first connection comprises the first sub-channel.

36. (New) The system of Claim 35 wherein the first connection further
comprises:

a plurality of sub-channels.

37. (New) The system of Claim 36, wherein

the first network node is further configured to

generate a bitmap providing a status of each of the plurality of sub-
channels comprising the first connection.

38. (New) The system of Claim 37, wherein

the bitmap is comprised of information of the degradation of each sub-channel
comprising the first connection.

39. (New) The system of Claim 34, wherein

the first network node is further configured to

perform analysis of the empty payload to determine whether a signal
transmitted on the first sub-channel remains degraded.

40. (New) The system of Claim 39, wherein

the first network node is further configured to

upon a determination that the signal transmitted on the first sub-channel is
not degraded, transmit to the second network node information of
the status of the first sub-channel; and

the second network node is further configured to

in response to said information, transmit a payload comprising data to the
first network node on the first sub-channel.

41. (New) The system of Claim 34 further comprising:

a second connection coupling the first network node and the second network node,
wherein

the second connection comprises a second sub-channel; and

the second network node further configured to

in response to the information regarding the degradation of the first sub-channel, redirect a payload containing data from the first sub-channel to the second sub-channel.

42. (New) An apparatus comprising:

means for receiving a degradation notification that a first sub-channel of a first connection to a remote node is degraded; and

means for responding to the degradation notification by transmitting an empty payload on the first sub-channel.

43. (New) The apparatus of Claim 42, wherein the first connection with the remote node comprises:

one or more sub-channels.

44. (New) The apparatus of Claim 43 further comprising:

means for receiving a sub-channel bitmap comprising a status corresponding to each of the one or more sub-channels, wherein

the status comprises one of

the degradation notification, and

notification that the sub-channel is not degraded.

45. (New) The apparatus of Claim 42 further comprising:

means for transmitting a payload comprising data on a second sub-channel of a second connection with the remote node, wherein

the payload comprising data would have been transmitted on the first sub-channel but for the degradation.

46. (New) The apparatus of Claim 42 further comprising:

means for receiving a non-degradation notification that the first sub-channel of the first connection with the remote node is no longer degraded; and

means for responding to the non-degradation notification by transmitting a payload comprising data on the first sub-channel.

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47. (New) An apparatus comprising:

means for analyzing for degradation a signal received on a first sub-channel of a

    first connection to a remote node, wherein

        the first connection comprises a plurality of sub-channels; and

means, responsive to a determination that the signal is degraded,

    for informing the remote node that the first sub-channel is experiencing

        degradation, and

    for analyzing subsequent signals received on the first sub-channel for

        correction of the degradation.

48. (New) The apparatus of Claim 47 wherein the means for analyzing for
degradation comprises:

means for analyzing the signal for at least one of the following error conditions

    a bit error rate (BER) greater than a threshold value,

    a loss of signal (LOS),

    a loss of frame (LOF),

    a cyclic redundancy check (CRC) error, and

    a remote defect.

49. (New) The apparatus of Claim 48 further comprising:

means for determining the presence of a remote defect upon receiving an alarm

    indication signal transmitted by the remote node.

50. (New) The apparatus of Claim 48 further comprising:

means for setting an error condition field corresponding to an error condition

    present, wherein

        the error condition field corresponds to the first sub-channel.

51. (New) The apparatus of Claim 47 wherein the means for informing the
remote node comprises:

means for generating a bitmap, wherein

    each bitmap bit corresponds to a sub-channel in the first connection,

    each bitmap bit is cleared at initialization, and

    for each degraded signal received, a bitmap bit corresponding to the sub-

        channel on which the degraded signal was received is set.

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52. (New) The apparatus of Claim 51 wherein the means for informing the remote node further comprises:

means for transmitting the bitmap to the remote node.

53. (New) The apparatus of Claim 51 wherein the means for analyzing subsequent signals received on the first sub-channel for correction of the degradation comprises:

means for receiving test signals comprising empty payloads on the first sub-
channel;

means for analyzing the test signals for degradation;

means, responsive to a determination that the test signals are not degraded,
for informing the remote node that the first sub-channel is not
experiencing degradation.

54. (New) The apparatus of Claim 53, wherein the means for informing the remote node that the first sub-channel is not experiencing degradation comprises:

means for clearing the bitmap bit corresponding to the first sub-channel; and

means for transmitting the bitmap to the remote node.

55. (New) The apparatus of Claim 53 further comprising:

means, responsive to a determination that the test signals are not degraded,
for clearing an error condition field corresponding to the first sub-channel.

56. (New) A computer program product comprising:

signal bearing media bearing programming adapted to

receive a degradation notification that a first sub-channel of a first
connection to a remote node is degraded, and

transmit an empty payload on the first sub-channel in response to the
degradation notification.

57. (New) The computer program product of Claim 56, wherein the first connection with the remote node comprises:

one or more sub-channels.

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58. (New) The computer program product of Claim 57 further comprising:

signal bearing media bearing programming further adapted to

receive a sub-channel bitmap comprising a status corresponding to each of

the one or more sub-channels, wherein

the status comprises one of

the degradation notification, and

notification that the sub-channel is not degraded.

59. (New) The computer program product of Claim 56 further comprising:

signal bearing media bearing programming further adapted to

transmit a payload comprising data on a second sub-channel of a second

connection with the remote node, wherein

the payload comprising data would have been transmitted on the

first sub-channel but for the degradation.

60. (New) The computer program product of Claim 56 further comprising:

signal bearing media bearing programming further adapted to

receive a non-degradation notification that the first sub-channel of the first

connection with the remote node is no longer degraded, and

transmit a payload comprising data on the first sub-channel in response to

the non-degradation notification.

61. (New) A computer program product comprising:

signal bearing media bearing programming adapted to

analyze for degradation a signal received on a first sub-channel of a first

connection to a remote node, wherein

the first connection comprises a plurality of sub-channels; and

upon a determination that the signal is degraded,

inform the remote node that the first sub-channel is experiencing

degradation, and

analyze subsequent signals received on the first sub-channel for

correction of the degradation.

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62. (New) The computer program product of Claim 61 wherein the signal bearing media bearing programming adapted to analyze for degradation comprises:

signal bearing media bearing programming further adapted to

analyze the signal for at least one of the following error conditions

a bit error rate (BER) greater than a threshold value,

a loss of signal (LOS),

a loss of frame (LOF),

a cyclic redundancy check (CRC) error, and

a remote defect.

63. (New) The computer program product of Claim 62 further comprising:

signal bearing media bearing programming further adapted to

determine the presence of a remote defect upon receiving an alarm

indication signal transmitted by the remote node.

64. (New) The computer program product of Claim 62 further comprising:

signal bearing media bearing programming further adapted to

set an error condition field corresponding to an error condition present,

wherein

the error condition field corresponds to the first sub-channel.

65. (New) The computer program product of Claim 61 wherein the signal bearing media bearing programming adapted to inform the remote node comprises:

signal bearing media bearing programming further adapted to

generate a bitmap, wherein

each bitmap bit corresponds to a sub-channel in the first

connection,

each bitmap bit is cleared at initialization, and

for each degraded signal received, a bitmap bit corresponding to

the sub-channel on which the degraded signal was received

is set.

66. (New) The computer program product of Claim 65 wherein the signal bearing media bearing programming adapted to inform the remote node further comprises:

signal bearing media bearing programming further adapted to

transmit the bitmap to the remote node.

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67. (New) The computer program product of Claim 65 wherein the signal bearing media bearing programming adapted to analyze subsequent signals received on the first sub-channel for correction of the degradation comprises:

signal bearing media bearing programming further adapted to

receive test signals on the first sub-channel comprising empty payloads;

analyze the test signals for degradation;

upon a determination that the test signals are not degraded,

inform the remote node that the first sub-channel is not

experiencing degradation.

68. (New) The computer program product of Claim 67, wherein the signal bearing media bearing programming adapted to inform the remote node that the first sub-channel is not experiencing degradation comprises:

signal bearing media bearing programming further adapted to

clear the bitmap bit corresponding to the first sub-channel; and

transmit the bitmap to the remote node.

69. (New) The computer program product of Claim 67 further comprising:

signal bearing media bearing programming further adapted to

clear an error condition field corresponding to the first sub-channel upon a

determination that the test signals are not degraded.

REMARKS

Claims 20-69 are pending. Original claims 1-19 have been canceled. New claims 20-69 have been added. The specification has been amended to reflect the fact that the present application is a continuation of application Serial Number 10/086,273 and its genealogy and to revise the summary and abstract. No new matter has been added.

Because no new matter has been added by these claims, Applicants respectfully submit that the above-referenced continuation application is entitled to claim the same priority date as that of parent application Serial Number 10/086,273, filed on February 20, 2002.
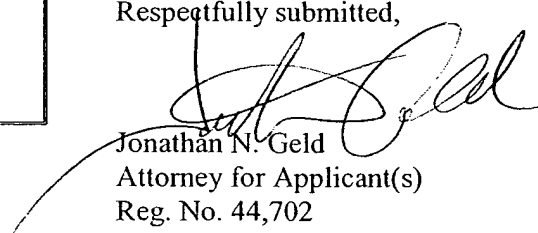
CONCLUSION

In view of the amendments and remarks set forth herein, the application and the claims therein are believed to be in condition for allowance without any further examination and a notice to that effect is solicited. Nonetheless, should any issues remain that might be subject to resolution through a telephonic interview, the Examiner is invited to telephone the undersigned at 512-439-5090.

EXPRESS MAIL LABEL NO: EV 304739824 US

Respectfully submitted,

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